

# ACTUARIAL VALUATION REPORT



Revere  
Contributory Retirement System  
January 1, 2013





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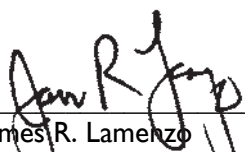
# I. INTRODUCTION & CERTIFICATION

This report presents the results of the actuarial valuation of the Revere Contributory Retirement System. The valuation was performed as of January 1, 2013 pursuant to Chapter 32 of the General Laws of the Commonwealth of Massachusetts.

This valuation was based on member data as of December 31, 2012, which was supplied by the Retirement Board. Such tests as we deemed necessary were performed on the data to ensure accuracy. Asset information as of December 31, 2012 was provided in the Annual Statement for the Financial Condition as submitted to this office in accordance with G.L. c. 32, ss. 20(5)(h), 23(1) and 23(2)(e). Both the membership data and financial information were reviewed for reasonableness, but were not audited by us.

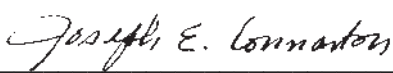
I am a member of the Academy of Actuaries and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained in this report. In my opinion, the actuarial assumptions used in this report are reasonable, are related to plan experience and expectations, and represent our best estimate of anticipated experience under the system. I believe this report represents an accurate appraisal of the actuarial status of the system performed in accordance with generally accepted actuarial principles and practices relating to pension plans.

Respectfully submitted,  
Public Employee Retirement Administration Commission



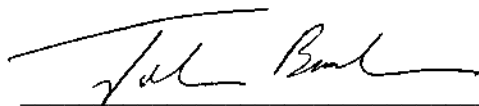
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Member of the American Academy of Actuaries  
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Enrolled Actuary Number 11-4709



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Joseph E. Connarton  
Executive Director



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Senior Actuarial Associate

February 20, 2014

## 2. EXECUTIVE SUMMARY

### PART A | COSTS UNDER CURRENT VALUATION

The principal results of the January 1, 2013 actuarial valuation are shown below.

#### Present Value of Future Benefits

Actives	\$120,711,565
Retirees, Survivors, and Inactives	<u>112,193,250</u>
Total	\$232,904,815

#### Normal Cost

Total Normal Cost	\$4,354,737
Expected Employee Contributions	<u>2,359,321</u>
Net Normal Cost	<u>\$1,995,416</u>

#### Actuarial Liability and Development of Unfunded Actuarial Liability

Actives	\$84,906,597
Retirees, Survivors, and Inactives	<u>112,193,250</u>
Total	\$197,099,847
Assets	<u>102,117,885</u>
Unfunded Actuarial Liability	<u>\$94,981,962</u>

The Board recently adopted a funding schedule effective in FY14. The appropriation for FY14 under this funding schedule is shown on page 9 and the complete funding schedule is shown on page 10.

## 2. EXECUTIVE SUMMARY *(continued)*

### PART B | COMPARISON WITH PRIOR VALUATION

The last full valuation was performed by PERAC as of January 1, 2011. Our Local Experience Study Analysis (issued in March, 2002) forms the basis for most of the actuarial assumptions (other than the investment return assumption) used in this valuation. The investment return assumption was decreased from 8.0% to 7.75% effective with this valuation. In addition, the mortality assumption has been modified to reflect future mortality improvement and the salary increase assumption has been lowered to better reflect the current economic environment (see Part C). Below we have shown the comparison between the two valuations.

	PERAC 1/1/13	PERAC 1/1/11	Increase (Decrease)	% Increase (Decrease)
Total Normal Cost	\$4,354,737	\$4,077,744	\$276,993	6.8%
Expected Employee Contributions	<u>2,359,321</u>	<u>2,161,255</u>	<u>198,066</u>	9.2%
Net Normal Cost	<u>\$1,995,416</u>	<u>\$1,916,489</u>	<u>\$78,927</u>	4.1%
Actuarial Liability				
Actives	\$84,906,597	\$72,696,700	\$12,209,897	16.8%
Retirees and Inactives	<u>112,193,250</u>	<u>105,879,072</u>	<u>6,314,178</u>	6.0%
Total	\$197,099,847	\$178,575,772	\$18,524,075	10.4%
Assets	<u>102,117,885</u>	<u>102,944,834</u>	<u>(826,949)</u>	(0.8%)
Unfunded Actuarial Liability	<u>\$94,981,962</u>	<u>\$75,630,938</u>	<u>\$19,351,024</u>	25.6%
Funded Ratio	51.8%	57.6%	(5.8%)	

## 2. EXECUTIVE SUMMARY *(continued)*

### PART B | COMPARISON WITH PRIOR VALUATION *(continued)*

Actives	PERAC 1/1/13	PERAC 1/1/11	% Difference
Number	538	492	9.3%
Total Payroll	\$27,430,526	\$25,257,501	8.6%
Average Salary	\$50,986	\$51,336	(0.7%)
Average Age	49.7	49.9	(0.4%)
Average Service	13.0	12.8	1.6%

Retirees and Survivors	PERAC 1/1/13	PERAC 1/1/11	% Difference
Number	528	544	(2.9%)
Total Benefits*	\$13,130,907	\$12,463,502	5.4%
Average Benefits*	\$24,869	\$22,911	8.5%
Average Age	76.0	75.9	0.1%

*\*excluding State reimbursed COLA*

## 2. EXECUTIVE SUMMARY *(continued)*

### PART C | PLAN EXPERIENCE AND CHANGES FROM PRIOR VALUATION

#### **Plan Experience**

##### *Plan Liabilities*

Since the last valuation, there was a loss on plan liabilities of approximately \$2.2 million (the actuarial liability was greater than expected). There was a gain due to salary increases for continuing active members increasing less than assumed (average pay increased 3.6% per year for continuing actives). This gain was more than offset due to losses from other sources including disability retirements and new employees with past creditable service. This loss is determined before reflecting the assumption changes discussed below.

##### *Plan Assets*

The Board previously adopted an asset smoothing methodology to determine the actuarial value of assets. As of January 1, 2013, the actuarial value of assets is \$102.1 million compared to the market value of \$104.5 million. There was an asset loss on a market value basis of approximately \$2.4 million over the 2-year period. The rates of return on a market value basis in 2011 and 2012 were 0.1% and 13.7% respectively.

As of January 1, 2013, the 2008 investment loss has been completely recognized. However, the final recognition of the 2008 loss and the investment return during 2011 and 2012 generated an asset loss of approximately \$14.1 million over the two year period on an actuarial value basis.

##### *Total*

There was a total net loss of approximately \$16.3 million since the last valuation (\$2.2 million loss on actuarial liability plus \$14.1 million loss on the actuarial value of assets). We indicated in our last valuation that such a loss and the corresponding increase in the Unfunded Actuarial Liability (UAL) was a likely scenario due to the final recognition of the 2008 investment loss.

#### **Actuarial Assumptions**

##### *Investment Return*

PERAC's "standard" investment return assumption was 8.0% in our 2012 actuarial valuations. This had been our standard assumption (assuming a reasonable asset allocation) for over 15 years. We believe this assumption could still be considered reasonable as of January 1, 2013. However, based on the current environment, asset allocation, and future expected returns, we recommended that the investment return assumption be decreased to 7.75% this year. The trend both in Massachusetts and across the country over the past 10 years has been to reduce this assumption. A reduction in the investment return assumption increases the plan's liabilities.



## 2. EXECUTIVE SUMMARY *(continued)*

### PART C | PLAN EXPERIENCE AND CHANGES FROM PRIOR VALUATION *(continued)*

#### *Salary increase*

In the current environment, we believe the salary increase assumption used in the prior valuation is conservative. Therefore, we lowered the salary increase assumption in this valuation. This change decreases the plan's liability. Over the long term, the investment return assumption and the salary increase assumption should move together. This is because both assumptions have an inflation component. The change in the salary increase assumption partially mitigates the impact of the change in the investment return assumption.

The prior salary increase assumption is based on job group and service. The largest increases are in the first few years of service. The assumption grades down each year to an ultimate rate of 4.75% - 5.25% after 10 years of service. For the past 4-5 years, most plans have had significant actuarial gains due to actual salary increases being less than assumed. Our revised assumption slightly reduces the assumption at each year of service. The revised ultimate rates are 4.25% - 4.75%. Although these may still seem somewhat high in the current environment, these are intended to be long term, not short term, rates.

#### *Mortality*

In local actuarial valuations performed by PERAC as of January 1, 2010, we used the RP-2000 mortality table. This is a standard table we have used since 2002 and is based on an experience analysis of local systems we performed in 2002. A revision to the actuarial standards of practice in 2010 required that future mortality improvements (longer life expectancy) be considered in valuations performed after July, 2011. To begin recognizing this change, as part of our January 1, 2011 local actuarial valuations, we used the RP-2000 mortality table adjusted 10 years with Scale AA (the assumption used in your prior valuation). In our 2012 valuations, to reflect future mortality improvement, we extended this mortality improvement scale beyond 2012. We used this same approach in our 2013 valuations.

#### *Overall Impact*

The overall impact of these assumption changes increased the plan's actuarial liability by approximately \$4.7 million. However the total normal cost decreased by \$3,000.

## 2. EXECUTIVE SUMMARY *(continued)*

### PART C | PLAN EXPERIENCE AND CHANGES FROM PRIOR VALUATION *(continued)*

#### **Chapter 176 Provisions**

Chapter 176 of the Acts of 2011, An Act Providing for Pension Reform and Benefit Modernization made a number of changes to the Chapter 32 pension law. There are several changes that will have the most impact on decreasing plan liabilities over the longer term. These include an increase in the normal retirement age by two years (for example, from age 65 to age 67 for Group I members), an increase in the age (early retirement) reduction factor for ages below the maximum age (from a 4.0% to a 6.0% annual reduction), and an increase in the period for determining a member's average annual compensation (from 3 years to 5 years). Since these changes are effective only for members hired after April 1, 2012, this is the first actuarial valuation to reflect these changes.

As of January 1, 2013, there were 18 members hired after April 1, 2012. Since these members have less than one year of service and are generally young, there is relatively little impact on plan costs in this valuation. The normal cost decreased approximately \$9,000 and the actuarial liability decreased approximately \$15,000 for these members compared to the figures under the prior provisions.

#### **COLA Base**

This valuation reflects the current COLA base of \$12,000. Our understanding is that an increase in the COLA base of \$1,000 per year to \$15,000 over three years is currently being considered. In our October 20, 2011 letter, we provided an estimate of the cost of an increase in the COLA base to \$14,000 as \$220,000 in the initial year for the schedule that was adopted (amortization to FY27). If the phased-in \$15,000 COLA base were adopted, the increase in the funding schedule adopted by the board would be approximately \$340,000.

We recommend that if a system increases the COLA base, there should be a corresponding increase in appropriation to reflect the cost of the benefit enhancement. Alternatively, a schedule could be adopted that maintains the current appropriation levels by extending the amortization of the UAL by one or two years. Although this methodology is allowable, we do not recommend such an approach.

#### **Funding Schedule**

The funding schedule presented in this report was recently adopted by the board. The FY13 payment and the amortization of the Early Retirement Incentive Programs (ERIs) are maintained from the prior schedule except the amortization basis was revised to reflect the change in the investment return assumption. The schedule amortizes the unfunded actuarial liability through 2031 with amortization payments increasing 3.8% each year.

### 3. SUMMARY OF VALUATION RESULTS

A. Number of Members on Current Valuation Date	
Active Members	538
Vested Terminated Members	9
Retired Members and Survivors	<u>528</u>
Total	1,075
B. Total Regular Compensation of Active Members	\$27,430,526
C. Normal Cost	
Superannuation	\$2,931,242
Death	276,706
Disability	890,788
Termination	<u>256,001</u>
Total Normal Cost	\$4,354,737
Expected Employee Contributions	<u>2,359,321</u>
Net Employer Normal Cost	\$1,995,416
D. Actuarial Liability	
Active	
Superannuation	\$78,765,169
Death	1,525,185
Disability	3,572,454
Termination	<u>1,043,789</u>
Total Active	\$84,906,597
Vested Terminated Members	1,152,944
Non-Vested Terminated Members	485,263
Retirees and Survivors	<u>110,555,043</u>
Total Actuarial Liability	\$197,099,847
E. Actuarial Value of Assets	102,117,885
F. Unfunded Actuarial Liability: D – E	\$94,981,962
G. Funded Ratio: E/D	51.8%

## 4. APPROPRIATION DEVELOPMENT FOR FISCAL YEAR 2014

### PART A | DERIVATION OF APPROPRIATION

#### Cost Under Current Funding Schedule

1. a. Normal Cost as of January 1, 2013	\$1,995,416
b. For FY14 (adjusted for timing)	\$2,124,501
c. Estimated Expenses	\$350,000
d. Total Employer Normal Cost (b+c)	\$2,474,501
2. a. Unfunded Actuarial Liability as of January 1, 2013	\$92,476,620
b. FY14 amortization payment (18-year, 3.8% increasing)*	\$7,440,325
3. a. Unfunded Liability due to 2002 ERI	\$1,440,240
b. FY14 amortization payment (6-year, level)	\$305,481
4. a. Unfunded Liability due to 2003 ERI	\$711,920
b. FY14 amortization payment (7-year, level)	\$133,948
5. a. Unfunded Liability due to Pension Deferral	\$353,182
b. FY14 amortization payment (7-year, level)	\$66,451
6. Net 3(8)(c) payments	\$40,000
7. Total FY14 Payment [Sum of 1(d), 2(b), 3(b), 4(b), 5(b), and 6]	\$10,460,706

\* FY14 appropriation was maintained at the same level as the prior schedule.

## 4. APPROPRIATION DEVELOPMENT FOR FISCAL YEAR 2014

(continued)

### PART B | CURRENT FUNDING SCHEDULE

<b>Fiscal Year</b>	<b>Normal Cost</b>	<b>Net 3(8)(c)</b>	<b>Amort. of UAL</b>	<b>Amort. of 2002 ERI</b>	<b>Amort. of 2003 ERI</b>	<b>Pension Deferral</b>	<b>Total Cost</b>	<b>Unfunded Act. Liab.</b>
2014	2,474,501	40,000	7,440,325	305,481	133,948	66,451	10,460,706	98,662,514
2015	2,598,226	40,000	7,648,315	305,481	133,948	66,451	10,792,421	97,954,588
2016	2,728,137	40,000	7,938,951	305,481	133,948	66,451	11,212,968	96,973,127
2017	2,864,544	40,000	8,240,631	305,481	133,948	66,451	11,651,055	95,610,042
2018	3,007,771	40,000	8,553,775	305,481	133,948	66,451	12,107,426	93,824,145
2019	3,158,160	40,000	8,878,818	305,481	133,948	66,451	12,582,858	91,570,616
2020	3,316,068	40,000	9,216,213		133,948	66,451	12,772,681	88,800,703
2021	3,481,871	40,000	9,566,429				13,088,301	85,782,568
2022	3,655,965	40,000	9,929,954				13,625,919	82,373,018
2023	3,838,763	40,000	10,307,292				14,186,055	78,317,034
2024	4,030,701	40,000	10,698,969				14,769,670	73,549,996
2025	4,232,236	40,000	11,105,530				15,377,766	68,001,722
2026	4,443,848	40,000	11,527,540				16,011,388	61,596,017
2027	4,666,041	40,000	11,965,587				16,671,627	54,250,188
2028	4,899,343	40,000	12,420,279				17,359,622	45,874,516
2029	5,144,310	40,000	12,892,249				18,076,559	36,371,686
2030	5,401,525	40,000	13,382,155				18,823,680	25,636,180
2031	5,671,602	40,000	13,890,677				19,602,278	13,553,608
2032	5,955,182	40,000					5,995,182	0

All amounts assume payments will be made November 1 of each fiscal year.

Amortization of unfunded liability on 3.8% annual increasing basis to FY31.

Normal cost includes assumed expenses of \$350,000 and is assumed to increase 5% per year.

FY14 appropriation was maintained at the same level as the prior schedule.

## 5. GASB STATEMENT NO. 25: ACTUARIAL INFORMATION

The actuarial information required by Governmental Accounting Standards Board (GASB) Statement No. 25 is shown below.

### Schedule of Funding Progress

Actuarial Valuation Date	Actuarial Value of Assets (a)	Actuarial Accrued Liability (AAL)* (b)	Unfunded AAL (UAAL) (b-a)	Funded Ratio (a/b)	Covered Payroll (c)	UAAL as a % of Cov. Payroll ((b-a)/c)
1/1/2013	\$102,117,885	\$197,099,847	\$94,981,962	51.8%	\$27,430,526	346.3%
1/1/2011	\$102,944,834	\$178,575,772	\$75,630,938	57.6%	\$25,257,501	299.4%
1/1/2008	\$97,013,837	\$163,452,818	\$66,438,981	59.4%	\$23,567,705	281.9%

\*excludes State reimbursed COLA

### Notes To Schedules

Additional information as of the latest actuarial valuation follows.

Valuation Date	January 1, 2013
Actuarial Cost Method	Individual entry age normal
Amortization Method	3.8% increasing
Remaining Amortization Period	18 years
Asset Valuation Method	Actuarial value, 5-year smoothing

### Principal Actuarial Assumptions:

Investment Rate of Return	7.75%
Projected Salary Increases	Service based table with ultimate rates of 4.25%, 4.50%, and 4.75% for groups 1, 2, and 4 respectively.

## 6. PLAN ASSETS

### A | BREAKDOWN OF ASSETS BY INVESTMENT TYPE

Cash and Cash Equivalents	\$2,648,994
Short Term Investments	12
PRIT Fund	101,825,585
Accounts Receivable	28,086
Accounts Payable	(289)
Total	\$104,502,388

### B | BREAKDOWN OF ASSETS BY FUND

Annuity Savings Fund	\$28,276,125
Annuity Reserve Fund	7,200,430
Pension Fund	1,664,913
Pension Reserve Fund	<u>67,360,920</u>
Total	\$104,502,388

C | MARKET VALUE OF ASSETS \$104,502,388

D | ACTUARIAL VALUE OF ASSETS \$102,117,885

## 6. PLAN ASSETS *(continued)*

### E | DEVELOPMENT OF ACTUARIAL VALUE OF ASSETS

	2012	2013
<b>A. Development of total investment income including appreciation</b>		
1. Beginning of year market value	94,041,411	104,502,388
2a. Employee contributions	2,574,829	
b. Employer contributions	9,921,503	
c. Other receipts	828,825	
d. Total receipts: (a) + (b) + (c)	13,325,157	
e. Benefit payments	13,566,997	
f. Expenses	735,399	
g. Other disbursements	946,959	
h. Total disbursements: (e) + (f) + (g)	15,249,355	
i. Cash flow: (d) – (h)	(1,924,198)	
3. End of year market value	104,502,388	
4. Investment income including appreciation: (3) – (1) – (2(i))	12,385,175	
<b>B. Expected market value development</b>		
1. Beginning of year market value	94,041,411	
2. Cash flow (A2(i))	(1,924,198)	
3. Expected Return on (1)	7,523,313	
4. Expected return on cash flow A2(i) x 0.08 / 2	(76,968)	
5. Expected market value end of year (1)+(2)+(3)+(4)	99,563,558	
<b>C. Gain/(loss) for year: A3-B5</b>	4,938,830	
<b>D. Development of Actuarial Value of Assets</b>		
1. Beginning of year market value	94,041,411	104,502,388
2a. Asset gain/(loss) in prior year	(7,339,316)	4,938,830
b. Asset gain/(loss) in 2 <sup>nd</sup> prior year	3,952,732	(7,339,316)
c. Asset gain/(loss) in 3 <sup>rd</sup> prior year	6,279,678	3,952,732
d. Asset gain/(loss) in 4 <sup>th</sup> prior year	(37,666,973)	6,279,678
3. Unrecognized gain/(loss) .8 x [2a] + .6 x [2b] + .4 x [2c] +.2 x [2d]	(8,521,337)	2,384,503
4. Beginning of year actuarial value of assets: [1] - [3]	102,562,748	102,117,885
5. Actuarial value / Market value	109.1%	97.7%
6. Adjusted actuarial value: (4) but not less than 90% nor greater than 110% of market value	102,562,748	102,117,885



## 7. INFORMATION ON SYSTEM MEMBERSHIP

A critical element of an actuarial valuation is accurate and up-to-date membership information. PERAC conducted an extensive review of member data submitted for this valuation.

### PART A | ACTIVE MEMBERS

	Actives	Vested Terminations
Number of Members	538	9
Average Age	49.7	57.2
Average Service	13.0	16.1
Average Salary	\$50,986	\$42,367
Average Annuity Savings Fund Balance	\$50,779	\$47,359

### Age by Service Distribution of Active Members

Present Age	Years of Service							Total
	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30+	
0 - 24	6							6
25 - 29	24	3	1					28
30 - 34	16	18	2					36
35 - 39	12	8	12	4				36
40 - 44	13	22	5	17	1			58
45 - 49	14	15	10	24	10	5		78
50 - 54	25	23	28	19	8	16	3	122
55 - 59	12	10	13	17	10	13	10	85
60 - 64	4	6	12	9	2	7	15	55
65+	2	4	8	6	5	4	5	34
Total	128	109	91	96	36	45	33	538

## 7. INFORMATION ON SYSTEM MEMBERSHIP *(continued)*

### PART A | ACTIVE MEMBERS *(continued)*

#### Salary by Age Distribution of Active Members

Present Age	Number of Members	Total Salary	Average Salary
0 - 24	6	\$159,074	\$26,512
25 - 29	28	\$1,117,948	\$39,927
30 - 34	36	\$1,698,362	\$47,177
35 - 39	36	\$1,912,920	\$53,137
40 - 44	58	\$3,198,312	\$55,143
45 - 49	78	\$4,310,857	\$55,267
50 - 54	122	\$6,032,200	\$49,444
55 - 59	85	\$4,444,261	\$52,285
60 - 64	55	\$3,110,434	\$56,553
65+	34	\$1,446,158	\$42,534
Total	538	\$27,430,526	\$50,986

## 7. INFORMATION ON SYSTEM MEMBERSHIP *(continued)*

### PART B | RETIREES AND SURVIVORS

	Superannuation	Ordinary Disability	Accidental Disability	Survivors	Total
Number of Members	298	8	110	112	528
Average Age	76.5	68.6	70.7	80.5	76.0
Average Annual Benefit	\$25,760	\$16,628	\$32,248	\$19,245	\$25,591

### Benefit by Payment and Retirement Type

	Superannuation	Ordinary Disability	Accidental Disability	Survivors	Total
Total Annuity	\$1,150,324	\$10,764	\$282,679	\$79,343	\$1,523,110
Pension (excluding State reimbursed COLA)	\$6,417,606	\$115,034	\$3,143,839	\$1,931,318	\$11,607,797
State reimbursed COLA	\$108,415	\$7,230	\$120,800	\$144,805	\$381,250
Total	\$7,676,345	\$133,028	\$3,547,318	\$2,155,466	\$13,512,157

## 7. INFORMATION ON SYSTEM MEMBERSHIP *(continued)*

### PART B | RETIREES & SURVIVORS *(continued)*

#### Benefit by Age Distribution

Present Age	Number of Members	Total Benefits	Average Benefits
Less than 40	2	\$39,523	\$19,762
40 - 44	3	\$92,422	\$30,807
45 - 49	5	\$170,020	\$34,004
50 - 54	10	\$295,134	\$29,513
55 - 59	26	\$1,046,589	\$40,253
60 - 64	43	\$1,422,307	\$33,077
65 - 69	84	\$2,790,299	\$33,218
70 - 74	73	\$2,122,247	\$29,072
75 - 79	67	\$1,394,987	\$20,821
80 - 84	78	\$1,580,592	\$20,264
85 - 89	81	\$1,579,622	\$19,502
90+	56	\$978,415	\$17,472
Totals	528	\$13,512,157	\$25,591

## 8. VALUATION COST METHODS

### PART A | ACTUARIAL COST METHOD

The Actuarial Cost Method which was used to determine pension liabilities in this valuation is known as the *Entry Age Normal Cost Method*. Under this method the *Normal Cost* for each active member on the valuation date is determined as the level percent of salary, which, if paid annually from the date the employee first became a member of the retirement system, would fully fund by retirement, death, disability or termination, the projected benefits which the member is expected to receive. The *Actuarial Liability* for each member is determined as the present value as of the valuation date of all projected benefits which the member is expected to receive, minus the present value of future annual Normal Cost payments expected to be made to the fund. Since only active members have a Normal Cost, the Actuarial Liability for inactives, retirees and survivors is simply equal to the present value of all projected benefits. The sum of Normal Cost and Actuarial Liability for each member is equal to the Normal Cost and Actuarial Liability for the Plan. The *Unfunded Actuarial Liability* is the Actuarial Liability less current assets.

The Normal Cost for a member will remain a level percent of salary for each year of membership except for changes in provisions of the Plan or the actuarial assumptions employed in projection of benefits and present value determinations. The Normal Cost for the entire system will also change due to the addition of new members or the retirement, death or termination of members. The Actuarial Liability for a member will increase each year to reflect the additional accrual of Normal Cost. It will also change if the Plan provisions or actuarial assumptions are changed.

Differences each year between the actual experience of the Plan and the experience projected by the actuarial assumptions are reflected by adjustments to the Unfunded Actuarial Liability. An experience difference which increases the Unfunded Actuarial Liability is called an *Actuarial Loss* and one which decreases the Unfunded Actuarial Liability is called an *Actuarial Gain*.

### PART B | ASSET VALUATION METHOD

The actuarial value of assets is determined in accordance with the deferred recognition method under which 20% of the gains or losses occurring in the prior year are recognized, 40% of those occurring 2 years ago, etc., so that 100% of gains or losses occurring 5 years ago are recognized. The actuarial value of assets will be adjusted, if necessary, in order to remain between 90% and 110% of market value.

## 9. ACTUARIAL ASSUMPTIONS

### INVESTMENT RETURN

7.75% per year

### INTEREST RATE CREDITED TO THE ANNUITY

### SAVINGS FUND

3.5% per year

### COST OF LIVING INCREASES

3.0% per year (of the first \$12,000)

### SALARY INCREASE

Service	Group 1	Group 2	Group 4
0	6.00%	6.00%	7.00%
1	5.50%	5.50%	6.50%
2	5.50%	5.50%	6.00%
3	5.25%	5.25%	5.75%
4	5.25%	5.25%	5.25%
5	4.75%	4.75%	5.25%
6	4.75%	4.75%	4.75%
7	4.50%	4.50%	4.75%
8	4.50%	4.50%	4.75%
9	4.25%	4.50%	4.75%
10+	4.25%	4.50%	4.75%

### MORTALITY

Pre-retirement rates reflect the RP-2000 Employees table projected 10 years with Scale AA (gender distinct). Post-retirement rates reflect the RP- 2000 Healthy Annuitant table projected 10 years with Scale AA (gender distinct). The liabilities are then increased .75% to approximate mortality improvement to 2020 for active members and 2015 for retirees. For disabled retirees, this table is set forward 2 years. It is assumed that 55% of pre-retirement deaths are job-related for Group 1 and 2 members and 90% are job-related for Group 4 members. For members retired under an Accidental Disability, 40% of deaths are assumed to be from the same cause as the disability.

## 9. ACTUARIAL ASSUMPTIONS *(continued)*

### WITHDRAWAL

Based on analysis of past experience. Annual rates are based on years of service. Sample annual rates for Groups 1 and 2 are shown below. For Group 4 members the rate is 0.015 each year for service up to and including 10 years. No withdrawal is assumed thereafter.

Service	Groups 1 & 2
0	0.150
5	0.076
10	0.054
15	0.033
20	0.020

### DISABILITY

Based on an analysis of past experience. It is also assumed that the percentage of job-related disabilities is 55% for Groups 1 & 2 and 90% for Group 4.

Age	Groups 1 & 2	Group 4
20	0.00010	0.0010
30	0.00030	0.0030
40	0.00101	0.0030
50	0.00192	0.0125
60	0.00280	0.0085

### EXPENSES

An amount of \$350,000 has been included in the Normal Cost for FY14. This amount includes estimated administrative expenses and a portion of the investment related expenses. This amount is assumed to increase by 5% each year.

## 9. ACTUARIAL ASSUMPTIONS *(continued)*

### RETIREMENT (SUPERANNUATION)

Age	Groups 1 & 2		Group 4
	Male	Female	
45-49	0.000	0.000	0.010
50	0.010	0.015	0.020
51	0.010	0.015	0.020
52	0.010	0.020	0.020
53	0.010	0.025	0.050
54	0.020	0.025	0.075
55	0.020	0.055	0.150
56	0.025	0.065	0.100
57	0.025	0.065	0.100
58	0.050	0.065	0.100
59	0.065	0.065	0.150
60	0.120	0.050	0.200
61	0.200	0.130	0.200
62	0.300	0.150	0.250
63	0.250	0.125	0.250
64	0.220	0.180	0.300
65	0.400	0.150	1.000
66	0.250	0.200	1.000
67	0.250	0.200	1.000
68	0.300	0.250	1.000
69	0.300	0.200	1.000
70 and after	1.000	1.000	1.000



## 10. SUMMARY OF PLAN PROVISIONS

### ADMINISTRATION

There are 105 contributory retirement systems for public employees in Massachusetts. Each system is governed by a retirement board and all boards, although operating independently, are governed by Chapter 32 of the Massachusetts General Laws. This law in general provides uniform benefits, uniform contribution requirements and a uniform accounting and funds structure for all systems.

### PARTICIPATION

Participation is mandatory for all full-time employees. Eligibility with respect to part-time, provisional, temporary, seasonal or intermittent employment is governed by regulations promulgated by the retirement board, and approved by PERAC. Membership is optional for certain elected officials.

There are 3 classes of membership in the retirement system:

#### **Group 1:**

General employees, including clerical, administrative, technical and all other employees not otherwise classified.

#### **Group 2:**

Certain specified hazardous duty positions.

#### **Group 4:**

Police officers, firefighters, and other specified hazardous positions.

### MEMBER CONTRIBUTIONS

Member contributions vary depending on the most recent date of membership:

Prior to 1975:	5% of regular compensation
1975 - 1983:	7% of regular compensation
1984 to 6/30/96:	8% of regular compensation
7/1/96 to present:	9% of regular compensation
1979 to present:	an additional 2% of regular compensation in excess of \$30,000.

In addition, members of Group 1 who join the system on or after April 2, 2012 will have their withholding rate reduced to 6 % after achieving 30 years of creditable service.

## 10. SUMMARY OF PLAN PROVISIONS *(continued)*

### RATE OF INTEREST

Interest on regular deductions made after January 1, 1984 is a rate established by PERAC in consultation with the Commissioner of Banks. The rate is obtained from the average rates paid on individual savings accounts by a representative sample of at least 10 financial institutions.

### RETIREMENT AGE

The mandatory retirement age for some Group 2 and Group 4 employees is age 65. Most Group 2 and Group 4 members may remain in service after reaching age 65. Group 2 and Group 4 members who are employed in certain public safety positions are required to retire at age 65. There is no mandatory retirement age for employees in Group 1.

### SUPERANNUATION RETIREMENT

A person who became a member before April 2, 2012 is eligible for a superannuation retirement allowance (service retirement) upon meeting the following conditions:

- completion of 20 years of service, or
- attainment of age 55 if hired prior to 1978, or if classified in Group 4, or
- attainment of age 55 with 10 years of service, if hired after 1978, and if classified in Group 1 or 2

A person who became a member on or after April 2, 2012 is eligible for a superannuation retirement allowance (service retirement) upon meeting the following conditions:

- attainment of age 60 with 10 years of service if classified in Group 1, or
- attainment of age 55 with 10 years of service if classified in Group 2, or
- attainment of age 55 if hired prior to 1978, or if classified in Group 4.

## 10. SUMMARY OF PLAN PROVISIONS *(continued)*

### AMOUNT OF BENEFIT

A member's annual allowance is determined by multiplying average salary by a benefit rate related to the member's age and job classification at retirement, and the resulting product by his creditable service. The amount determined by the benefit formula cannot exceed 80% of the member's highest three year (or five year salary as discussed below) average salary. For veterans as defined in G.L. c. 32, s. 1, there is an additional benefit of \$15 per year for each year of creditable service, up to a maximum of \$300.

- Salary is defined as gross regular compensation. For employees who become members after January 1, 2011, regular compensation is limited to 64% of the federal limit found in 26 U.S.C. 401(a)(17). In addition, regular compensation for members who retire after April 2, 2012 will be limited to prohibit "spiking" of a member's salary to increase the retirement benefit.
- For persons who became members prior to April 2, 2012, Average Salary is the average annual rate of regular compensation received during the 3 consecutive years that produce the highest average, or, if greater, during the last 3 years (whether or not consecutive) preceding retirement.
- For persons who became members on or after April 2, 2012, Average Salary is the average annual rate of regular compensation received during the 5 consecutive years that produce the highest average, or, if greater, during the last 5 years (whether or not consecutive) preceding retirement.
- The Benefit Rate varies with the member's retirement age. For persons who became members prior to April 2, 2012 the highest rate of 2.5% applies to Group 1 employees who retire at or after age 65, Group 2 employees who retire at or after age 60, and to Group 4 employees who retire at or after age 55. A .1% reduction is applied for each year of age under the maximum age for the member's group. For Group 2 employees who terminate from service under age 55, the benefit rate for a Group 1 employee shall be used.
- For persons who became members on or after April 2, 2012 and retire with less than 30 years of creditable service, the highest rate of 2.5% applies to Group 1 employees who retire at or after age 67, Group 2 employees who retire at or after age 62, and to Group 4 employees who retire at or after age 57. A .15% reduction is applied for each year of age under the maximum age for the member's group.
- For persons who became members on or after April 2, 2012 and retire with more than 30 years of creditable service, the highest rate of 2.5% applies to Group 1 employees who retire at or after age 67, Group 2 employees who retire at or after age 62, and to Group 4 employees who retire at or after age 55. A .125% reduction is applied for each year of age under the maximum age for the member's group.

## 10. SUMMARY OF PLAN PROVISIONS *(continued)*

### DEFERRED VESTED BENEFIT

A participant who has attained the requisite years of creditable service can elect to defer his or her retirement until a later date. Group 4 employees cannot defer beyond age 65. All participants must begin to receive a retirement allowance or withdraw their accumulated deductions no later than April 15 of the calendar year following the year they reach age 70½.

### WITHDRAWAL OF CONTRIBUTIONS

Member contributions may be withdrawn upon termination of employment. The interest rate for employees who first become members on or after January 1, 1984 who voluntarily withdraw their contributions with less than 10 years of service will be 3%. Interest payable on all other withdrawals will be set at regular interest.

### DISABILITY RETIREMENT

The Massachusetts Retirement Plan provides 2 types of disability retirement benefits:

#### ORDINARY DISABILITY

**Eligibility:** Non-veterans who become totally and permanently disabled by reason of a non-job related condition with at least 10 years of creditable service (or 15 years creditable service in systems in which the local option contained in G.L. c. 32, s.6(1) has not been adopted).

Veterans with ten years of creditable service who become totally and permanently disabled by reason of a non-job related condition prior to reaching “maximum age”. “Maximum age” applies only to employees classified in Group 4 who are subject to mandatory retirement.

**Retirement Allowance:** For persons who became members prior to April 2, 2012, the benefit is equal to the accrued superannuation retirement benefit as if the member was age 55. If the member is a veteran, the benefit is 50% of the member’s final rate of salary during the preceding 12 months, plus an annuity based upon accumulated member contributions plus credited interest. If the member is over age 55, he or she will receive not less than the superannuation allowance to which he or she is entitled.

For persons in Group 1 who became members on or after April 2, 2012, the benefit is equal to the accrued superannuation retirement benefit as if the member was age 60. If the member is a veteran, the benefit is 50% of the member’s final rate of salary during the preceding 12 months, plus an annuity based upon accumulated member contributions plus credited interest. If the member is over age 60, he or she will receive not less than the superannuation allowance to which he or she would have been entitled had they retired for superannuation.

## 10. SUMMARY OF PLAN PROVISIONS *(continued)*

### ORDINARY DISABILITY *(continued)*

For persons in Group 2 and Group 4 who became members on or after April 2, 2012, the benefit is equal to the accrued superannuation retirement benefit as if the member was age 55. If the member is a veteran, the benefit is 50% of the member's final rate of salary during the preceding 12 months, plus an annuity based upon accumulated member contributions plus credited interest. If the member is over age 55, he or she will receive not less than the superannuation allowance to which he or she is entitled

### ACCIDENTAL DISABILITY

**Eligibility:** Applies to members who become permanently and totally unable to perform the essential duties of the position as a result of a personal injury sustained or hazard undergone while in the performance of duties. There are no minimum age or service requirements.

**Retirement Allowance:** 72% of salary plus an annuity based on accumulated member contributions, with interest. This amount is not to exceed 100% of pay. For those who became members in service after January 1, 1988 or who have not been members in service continually since that date, the amount is limited to 75% of pay. There is an additional pension of \$774.36 per year (or \$312.00 per year in systems in which the local option contained in G.L. c. 32, s. 7(2)(a)(iii) has not been adopted), per child who is under 18 at the time of the member's retirement, with no age limitation if the child is mentally or physically incapacitated from earning. The additional pension may continue up to age 22 for any child who is a full time student at an accredited educational institution. For systems that have adopted Chapter 157 of the Acts of 2005, veterans as defined in G.L. c. 32, s. 1 receive an additional benefit of \$15 per year for each year of creditable service, up to a maximum of \$300.

### ACCIDENTAL DEATH

**Eligibility:** Applies to members who die as a result of a work-related injury or if the member was retired for accidental disability and the death was the natural and proximate result of the injury or hazard undergone on account of which such member was retired.

**Allowance:** An immediate payment to a named beneficiary equal to the accumulated deductions at the time of death, plus a pension equal to 72% of current salary and payable to the surviving spouse, dependent children or the dependent parent, plus a supplement of \$774.36 per year, per child (or \$312.00 per year in systems in which the local option contained in G.L. c. 32, s. 9(2)(d)(ii) has not been adopted), payable to the spouse or legal guardian until all dependent children reach age 18 or 22 if a full time student, unless mentally or physically incapacitated.

The surviving spouse of a member of a police or fire department or any corrections officer who, under specific and limited circumstances detailed in the statute, suffers an accident and is killed or sustains injuries while in the performance of his duties that results in his death, may receive a pension equal to the maximum salary for the position held by the member upon his death.

In addition, an eligible family member may receive a one time payment of \$100,000.00 from the State Retirement Board.

## 10. SUMMARY OF PLAN PROVISIONS *(continued)*

### DEATH AFTER ACCIDENTAL DISABILITY RETIREMENT

Effective November 7, 1996, Accidental Disability retirees were allowed to select Option C at retirement and provide a benefit for an eligible survivor. For Accidental Disability retirees prior to November 7, 1996, who could not select Option C, if the member's death is from a cause unrelated to the condition for which the member received accidental disability benefits, a surviving spouse will receive an annual allowance of \$6,000. For Systems that accept the provisions of Section 28 of Chapter 131 of the Acts of 2010, the amount of this benefit is \$9,000.

### DEATH IN ACTIVE SERVICE

**Allowance:** An immediate allowance equal to that which would have been payable had the member retired and selected Option C on the day before his or her death. For a member who became a member prior to April 2, 2012 whose death occurred prior to the member's superannuation retirement age, the age 55 benefit rate is used. For a member classified in Group I who became a member on or after April 2, 2012 whose death occurred, the age 60 benefit rate is used. If the member died after age 60, the actual age is used. The minimum annual allowance payable to the surviving spouse of a member in service who dies with at least two years of creditable service is \$3,000 unless the retirement system has accepted the local option increasing this minimum annual allowance to \$6,000, provided that the member and the spouse were married for at least one year and living together on the member's date of death.

The surviving spouse of such a member in service receives an additional allowance equal to the sum of \$1,440 per year for the first child and \$1,080 per year for each additional child until all dependent children reach age 18 or 22 if a full time student, unless mentally or physically incapacitated.

### COST OF LIVING

If a system has accepted Chapter 17 of the Acts of 1997, and the Retirement Board votes to pay a cost of living increase (COLA) for that year, the percentage is determined based on the increase in the Consumer Price Index used for indexing Social Security benefits, but cannot exceed 3.0%. Section 51 of Chapter 127 of the Acts of 1999, if accepted, allows boards to grant COLA increases greater than that determined by CPI but not to exceed 3.0%. The first \$12,000 of a retiree's total allowance is subject to a COLA. The total COLA for periods from 1981 through 1996 is paid for by the Commonwealth of Massachusetts.

Under the provisions of Chapter 32, Section 103(j) inserted by Section 19 of Chapter 188 of the Acts of 2010, systems may increase the maximum base on which the COLA is calculated in multiples of \$1,000. Each increase must be accepted by a majority vote of the Retirement Board and approved by the legislative body.

## 10. SUMMARY OF PLAN PROVISIONS *(continued)*

### METHODS OF PAYMENT

A member may elect to receive his or her retirement allowance in one of 3 forms of payment.

**Option A:** Total annual allowance, payable in monthly installments, commencing at retirement and terminating at the member's death.

**Option B:** A reduced annual allowance, payable in monthly installments, commencing at retirement and terminating at the death of the member, provided, however, that if the total amount of the annuity portion received by the member is less than the amount of his or her accumulated deductions, including interest, the difference or balance of his accumulated deductions will be paid in a lump sum to the retiree's beneficiary or beneficiaries of choice.

**Option C:** A reduced annual allowance, payable in monthly installments, commencing at retirement. At the death of the retired employee, 2/3 of the allowance is payable to the member's designated beneficiary (who may be the spouse, or former spouse who is unmarried at the time of retirement for a member whose retirement becomes effective on or after February 2, 1992, child, parent, sister, or brother of the employee) for the life of the beneficiary. For members who retired on or after January 12, 1988, if the beneficiary pre-deceases the retiree, the benefit payable increases (or "pops up" to Option A) based on the factor used to determine the Option C benefit at retirement. For members who retired prior to January 12, 1988, if the System has accepted Section 288 of Chapter 194 of the Acts of 1998 and the beneficiary pre-deceases the retiree, the benefit payable "pops up" to Option A in the same fashion. The Option C became available to accidental disability retirees on November 7, 1996.

### ALLOCATION OF PENSION COSTS

If a member's total creditable service was partly earned by employment in more than one retirement system, the cost of the "pension portion" is allocated between the different systems pro rata based on the member's service within each retirement system. If a member received regular compensation concurrently from two or more systems on or after January 1, 2010, and was not vested in both systems as of January 1, 2010, such a pro-rata will not be undertaken. This is because such a person will receive a separate retirement allowance from each system.

## II. GLOSSARY OF TERMS

### ACTUARIAL ACCRUED LIABILITY

That portion of the Actuarial Present Value of pension plan benefits which is not provided by future Normal Costs or employee contributions. It is the portion of the Actuarial Present Value attributable to service rendered as of the Valuation Date.

### ACTUARIAL ASSUMPTIONS

Assumptions, based upon past experience or standard tables, used to predict the occurrence of future events affecting the amount and duration of pension benefits, such as: mortality, withdrawal, disablement and retirement; changes in compensation; rates of investment earnings and asset appreciation or depreciation; and any other relevant items.

### ACTUARIAL COST METHOD (OR FUNDING METHOD)

A procedure for allocating the Actuarial Present Value of all past and future pension plan benefits to the Normal Cost and the Actuarial Accrued Liability.

### ACTUARIAL GAIN OR LOSS (OR EXPERIENCE GAIN OR LOSS)

A measure of the difference between actual experience and that expected based upon the set of Actuarial Assumptions, during the period between two Actuarial Valuation dates.

**Note:** The effect on the Accrued Liability and/or the Normal Cost resulting from changes in the Actuarial Assumptions, the Actuarial Cost Method, or pension plan provisions would be described as such, not as an Actuarial Gain (Loss).

### ACTUARIAL PRESENT VALUE

The dollar value on the valuation date of all benefits expected to be paid to current members based upon the Actuarial Assumptions and the terms of the Plan.

### AMORTIZATION PAYMENT

That portion of the pension plan appropriation which represents payments made to pay interest on and the reduction of the Unfunded Accrued Liability.



## II. GLOSSARY OF TERMS *(continued)*

### ANNUAL STATEMENT

The statement submitted to PERAC each year that describes the asset holdings and Fund balances as of December 31 and the transactions during the calendar year that affected the financial condition of the retirement system.

### ANNUITY RESERVE FUND

The fund into which total accumulated deductions, including interest, is transferred at the time a member retires, and from which annuity payments are made.

### ANNUITY SAVINGS FUND

The fund in which employee contributions plus interest credited are held for active members and for former members who have not withdrawn their contributions and are not yet receiving a benefit (inactive members).

### ASSETS

The value of securities as described in Section VIII.

### COST OF BENEFITS

The estimated payment from the pension system for benefits for the fiscal year. This was the minimum amount payable during the first six years of some funding schedules.

### FUNDING SCHEDULE

The schedule based upon the most recently approved actuarial valuation which sets forth the amount which would be appropriated to the pension system in accordance with Section 22(6A), Section 22D or Section 22F of M.G.L. Chapter 32.

### GASB

Governmental Accounting Standards Board

## II. GLOSSARY OF TERMS *(continued)*

### NORMAL COST

Total Normal Cost is that portion of the Actuarial Present Value of pension plan benefits, which is to be paid in a single fiscal year. The Employee Normal Cost is the amount of the expected employee contributions for the fiscal year. The Employer Normal Cost is the difference between the Total Normal Cost and the Employee Normal Cost.

### PENSION FUND

The fund into which appropriation amounts as determined by PERAC are paid and from which pension benefits are paid.

### PENSION RESERVE FUND

The fund which shall be credited with all amounts set aside by a system for the purpose of establishing a reserve to meet future pension liabilities. These amounts would include excess interest earnings.

### SPECIAL FUND FOR MILITARY SERVICE CREDIT

The fund which is credited with amounts paid by the retirement board equal to the amount which would have been contributed by a member during a military leave of absence as if the member had remained in active service of the retirement board. In the event of retirement or a non-job related death, such amount is transferred to the Annuity Reserve Fund. In the event of termination prior to retirement or death, such amount shall be transferred to the Pension Fund.

### UNFUNDED ACCRUED LIABILITY

The excess of the Actuarial Accrued Liability over the Assets.



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